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DROPLETS FROM THE PLANKTON NET. XXIII.
RECORD OF *SAPPHIRINA SALPAE* GIESBRECHT FROM THE NORTH
PACIFIC, WITH NOTES ON ITS COPEPODITE STAGES

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With 3 Text-figures

The author was attracted to a number of copepods found in the same bottle in which the specimens of *Pegea confoederata bicaudata* (QUOY et GAIMARD) described by FURUHASHI and TOKIOKA in the preceding article were preserved. These were identified as *Sapphirina salpae* CLAUS. They consisted of a male, eight females and some specimens of copepodite stages. As those salpas were collected by a hand-net stretched with the coarse nylon cloth with 3 mm meshes, it is supposed that the smaller specimens, for instance only 0.43 mm long copepodite, might have passed through the net. Nevertheless, the occurrence of small copepodites was ascertained in the sample; this seems to show that the copepods were living inside the body of salpas. WOLFENDEN (1911) observed the specimens of the same species in the north and south Atlantic oceans and stated that they were "beide Male an der Oberfläche zusammen mit Salpen, erbeutet."

S. salpae was described in detail by GIESBRECHT (1892). However, the species is recorded in the North Pacific only rarely and moreover no description of its copepodites is yet available. Thus, the author is going to give next a brief note on this copepod, together with the preliminary notes on its copepodite stages. He is much indebted to Dr. Otohiko TANAKA for his kindness in guiding the author so generously throughout the present study. Thanks also to Dr. Takasi TOKIOKA for his kindness in reading the paper.

Sapphirina salpae CLAUS, 1859

Sapphirina salpae, GIESBRECHT 1892, p. 618, Taf. 2, 52, 53, 54.

_____, WOLFENDEN 1911, p. 361.

_____, FARRAN 1929, p. 287.

Female: Length 6.4-7.4 mm, 7.2 mm specimen with a pair of egg-sacs

(Fig. 1, b). The ratio between the anterior and posterior body regions is 59:41. The anterior region is elongate. The head is longer than wide (55:45). The posterior region is composed of 6 segments, respectively with the following proportional lengths:

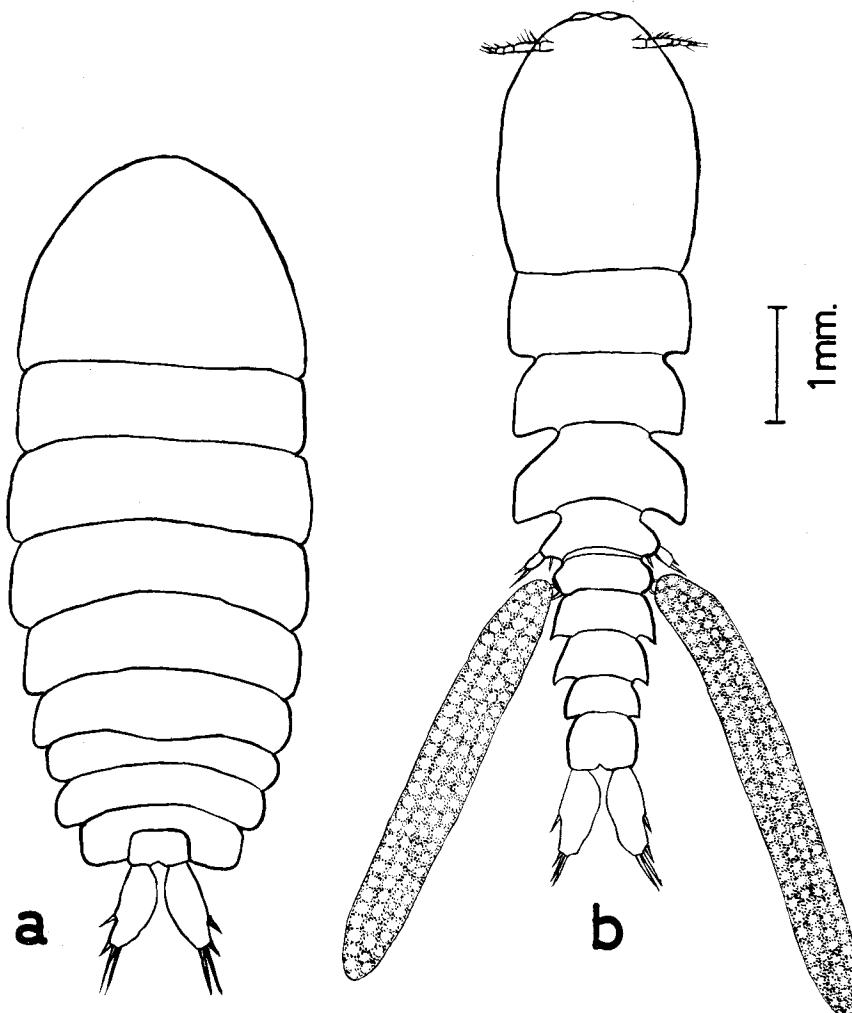


Fig. 1. *Sapphirina salpae* CLAUS
a, Adult male, dorsal aspect; b, adult female, dorsal aspect.

| Segment | Th-5 | Abd-1 | 2 | 3 | 4 | 5 | Furca |
|---------|------|-------|----|----|----|----|----------|
| | 14 | 9 | 13 | 13 | 10 | 17 | 24 = 100 |

The furcal rami 2.4 times as long as broad (Fig. 2, f). The median dorsal seta is situated at the distal 1/4 of the ramus. The first antenna 5-jointed

(Fig. 2, c). The 2nd antenna (Fig. 2, d) has the joints of the following proportional lengths:

| Joint | 1 | 2 | 3 | 4 (including terminal claw) |
|-------|----|----|----|-----------------------------|
| 31 | 38 | 15 | 16 | = 100 |



Fig. 2. *Sapphirina salpae* CLAUS

Female; c, 1st antenna; d, 2nd antenna; e, 4th leg; f, anal segment and furca, dorsal aspect. Male; g, 2nd antenna; h, anal segment and furca, dorsal aspect.

The terminal claw is very short. The endopodite of the 4th foot is as

long as the exopodite, the apex has two foliaceous spines. The outer margin of the 2nd and 3rd segments of the exopodite are furnished with spinules (Fig. 2, e).

Male: Length 7.0 mm. The head is wider than long (58:42). The posterior division is wider than in the female (Fig. 1, a). The furcal rami about 2 times as long as broad (Fig. 2, h). The 1st antenna (Fig. 2, g) and the 4th foot are similar to those of the female.

Copepodite stages: Fortunately, the sample contains specimens of all copepodite stages. The sexes are separable from each other in the cope-

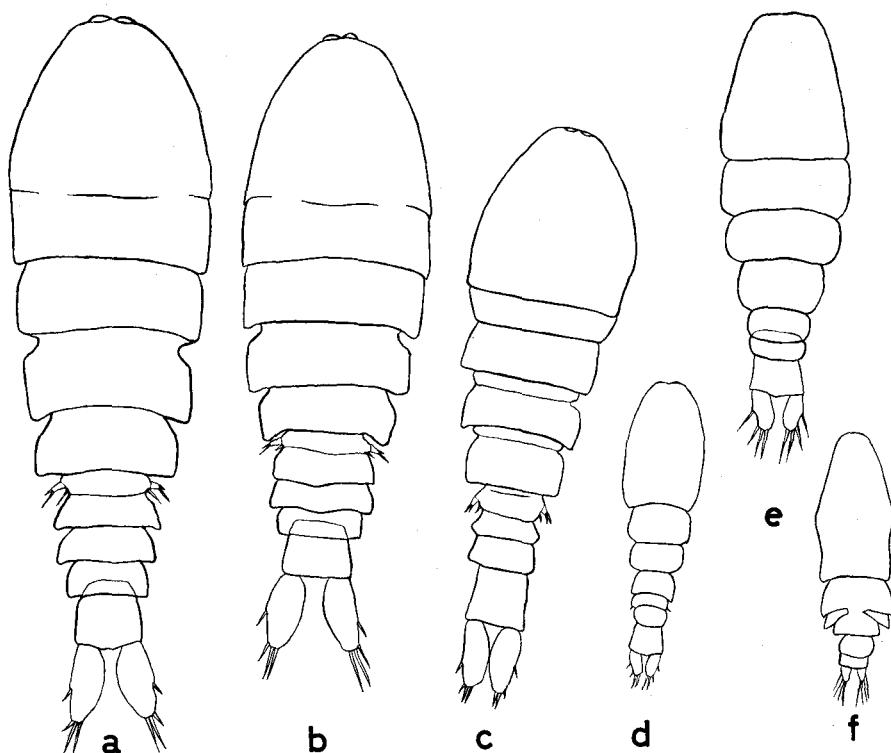


Fig. 3. *Sapphirina salpae* CLAUS.

a, Copepodite stage V, female ($\times 8.4$) ; b, copepodite stage V, male ($\times 8.4$) ; c, copepodite stage IV ($\times 21$) ; d, copepodite stage III ($\times 17$) ; e, copepodite stage II ($\times 42$) ; f, copepodite stage I ($\times 42$).

odite stage V (Fig. 3, a, b), but they are inseparable in other younger stages (Fig. 3, c-f). The cuticular lenses become visible in the dorsal view in the 4th copepodite stage. The body length, number of the swimming feet, and those of thoracic and abdominal (the first segment of the posterior body region is defined as the fifth thoracic segment) segments in respective copepodite

stages are given below:

| Stage | Body length in mm. | Number of swimming feet in pair | Number of thoracic segment | Number of ab- dominal segment |
|-------|-----------------------|------------------------------------|-------------------------------|----------------------------------|
| V ♀ | 4.05-4.45 | 5 | 5 | 4 |
| V ♂ | 3.79-4.05 | 5 | 5 | 4 |
| IV | 2.03-2.35 | 5 | 5 | 3 |
| III | 1.10-1.26 | 4 (+1 seta) | 5 | 2 |
| II | 0.71-0.80 | 3 (+1 seta) | 5 | 1 |
| I | 0.43-0.44 | 2 | 4 | 1 |

Remarks: BRADY's (1883) figures of *Sapphirina gemma* coincide exactly with those of *S. salpae* CLAUS, but the body length (3.1 mm) given by him is too small for *S. salpae* and rather it resembles that of *S. gemma* DANA. WILSON's (1942) figure of the furca of *S. salpae* agrees well with that of *S. gemma* DANA. Thus, his record of *S. salpae* from the Philippine waters seems to be uncertain. GIESBRECHT's (1892) specimens measured 5.6-7.5 mm (♀) and 5.9-7.5 mm (♂) in total length. FARRAN's (1929) specimens measured 6.22-6.84 mm (♀) and 6.6 mm (♂) in total length.

Distribution: North and south Atlantic oceans, off New Zealand and northwestern Pacific (present record).

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